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*Future Administration
of
State of Maryland
Water Resources Activities*

A REPORT TO THE GOVERNOR

STATE PLANNING DEPARTMENT

MARCH, 1961

STATE PLANNING DEPARTMENT
1103 State Office Building
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LETTER OF TRANSMITTAL

State Planning Department
Baltimore, Maryland
March 15, 1961

Dear Governor Tawes:

In compliance with your request and pursuant to the authority contained under the provisions of Paragraph 2e, Section 1 of Chapter 543, Acts of 1959, the State Planning Department has prepared the report, *Future Administration of State of Maryland Water Resources Activities*, which I am pleased to transmit herewith for your consideration.

The report is based upon a comprehensive study of the State's water resources administration made by the Planning Department with the cooperation of the various State agencies having water resources administration responsibilities. Detailed information supplied by these agencies regarding their present operations is included in the *Appendices* transmitted under separate cover.

In all phases of its undertaking, the Planning Department was benefited by the advisory assistance of Dr. Edward A. Ackerman, one of the nation's leading authorities in the field of water resources and water resources administration. Dr. Ackerman is presently Executive Officer of the Carnegie Institution of Washington.

I believe that the State water resources program and administrative changes required for its implementation called for in the report constitute the most effective means for maximizing the future benefits to be derived from the utilization of the State's water resources.

Respectfully,



Director

THE HONORABLE J. MILLARD TAWES
Governor of the State of Maryland
State House
Annapolis, Maryland

337028

ADDENDUM

Since the completion of this report, the General Assembly at its 1961 Session enacted into law House Bill No. 739 providing for the creation of a Natural Resources Institute under the operational supervision of the University of Maryland to supersede the present Department and Commission of Research and Education. This legislative action was in conformity with the recommendation appearing in Chapter 4 relative to the Department of Research and Education.

ACKNOWLEDGEMENTS

For their helpful cooperation and constructive suggestions in connection with the preparation of this report, grateful appreciation is extended to Dr. Joseph T. Singewald, Director, Department of Geology, Mines and Water Resources; Dr. Harry C. Byrd, Chairman, Tidewater Fisheries Commission; Mr. Paul W. McKee, Director, Water Pollution Control Commission; Mr. Harry Silberman, District Engineer, Water Pollution Control Commission; Mr. Ernest A. Vaughn, Director, Department of Game and Inland Fish; Dr. L. Eugene Cronin, Director, Department of Research and Education; Mr. Joseph F. Kaylor, Director, Department of Forests and Parks; Mr. William H. Bayliff, Executive Secretary, Board of Natural Resources; Mr. Paul M. Galbreath, Associate Extension Soil Conservationist; Mr. Robert M. Brown, Chief, Bureau of Environmental Hygiene of the Department of Health; Dr. Donald W. Pritchard, Director, Chesapeake Bay Institute, The Johns Hopkins University; Mr. Richard H. Collins, Member of Board of Natural Resources; and Dr. Abel Wolman, Professor Emeritus, The Johns Hopkins University.

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INTRODUCTION

The number and unusual structure of State agencies responsible for special water resource activities have led to frequent proposals for their consolidation, unification, or restructuring. Accordingly, a study of the functioning of these agencies and the problems likely to be faced by the State and its citizens in future water resource administration was undertaken by the State Planning Department approximately a year ago at the request of Governor Tawes. Although each of the agencies can point to a record of accomplishment, all reasonably admit that some improvement not only is possible but desirable in the future interests of the State. These views, which range from suggestions on special features of authorizing legislation to a suggestion for a comprehensive single-agency structure, all have been considered in presenting the conclusions and recommendations set down herewith.

While some may maintain that consolidation and unification of agency activities are desirable as a matter of principle, this study has not been approached in that spirit. Instead, reorganization has been considered only insofar as there seems to be a good case for it when the efficiency of State functions and the general welfare of the citizens of Maryland are taken into account. The first conclusion thus came relatively early in this study, namely, that preferences for one type of organization or another should be considered of secondary importance to the determined maintenance of certain objectives of accomplishment in managing the State's water resources. Once decision upon these objectives has been agreed upon and is firmly fixed as part of legislative and executive policy, then decisions upon agency structure, responsibility, budgets and programs come much more easily and naturally. Furthermore, meaningful performance reviews are as a consequence more readily possible.

In much of its past water resource activities, the State of Maryland has suffered not so much from multiple agencies as it has from a multiplicity of divergent and partial objectives. Multiple agencies and multiple objectives of course are not unrelated, but where there is clear leadership for a program with obvious public support, multiple agencies can and do share common objectives. The first major step in the study, therefore, consists in drafting desirable future objectives for the State in its water resource development and management.

Chapter 1

THE FUTURE STATE AND ITS WATER RESOURCE OBJECTIVES

To decide intelligently upon resource objectives, it is essential to assess the present physical, economic and social attributes of the State and to arrive at certain positive views as to the future on the basis of this knowledge. What sort of State will Maryland be twenty or even forty years from now? How many people will it embrace and where will they live? What economic ambitions and ideals of livelihood will the people have? Such considerations bear brief mention here as they are importantly related to later conclusions.

The State's Territory and Water Resources

Relative to its population both now and in the future, Maryland's area is small. The State is fortunate by comparison to some of the other states of the Union which must administer great areas with small productive content. Maryland is moderately well supplied with runoff without extreme seasonal deficits. A large section of the State, in addition, contains aquifers of substantial capacity. Perhaps its most pronounced individual characteristic is the large proportion of the State which is composed of a marine surface. About one-fifth of the State's surface is the "tide-water" Chesapeake Bay. The existence of this large estuarine area in the heart of the State should be noted with emphasis, because it has the most important biotic potential in the State, because it borders on the area of heaviest population and because of its very important recreational potentials. *Maryland is unique among the fifty states in this aspect of its territorial composition.*

Future Population

Even though the area of its land surface is relatively small, Maryland is not a small state. The population of

the State now stands at over 3,000,000 people. In addition, its water resources are of interest in one way or another to about one and one-half million more people in the neighboring District of Columbia, Delaware, Virginia and southeastern Pennsylvania. As presently will be shown, anticipated future population growth will increase greatly the number of people dependent upon the water resources of Maryland and the wisdom of their management.

The State is fortunate in having available some carefully made projections of population recently compiled for the purpose of federal water resource planning. A document prepared for the United States Senate Select Committee on National Water Resources presents a median estimate of the 1980 population of Maryland as 4,800,000, with some possibility that it may be as large as 5,500,000.¹ By the year 2000 the median estimate for the State's population is nearly 7,000,000, with the possibility that it may be as high as 9,000,000. Considering the populations of neighboring Delaware, the District of Columbia, northern Virginia and a small section of southeastern Pennsylvania, as many as 13,700,000 people (or nearly three times the present number) may be concerned forty years hence about the character of water resource development in this State. (See Table I at the end of report.) Based upon the median estimate, it is certainly safe to say that at least 10,500,000 people (or more than twice the present number) will have to be provided for in one or more of the requirements they place upon water, including recreation. From 65 to 70 per cent of these people will be urban and suburban residents in 1980 and from 70 to 75 per cent urban and suburban in the year 2000. The bulk of them will be living in the Chesapeake Bay area.²

This will be a dense population with relatively rapid accretions compared to the past. It offers opportunity for

¹ United States Senate Select Committee on National Water Resources, Committee Print No. 5, "Population Projections and Economic Assumptions," Washington, 1960, pp. 6-7.

² *Ibid.*, p. 13.

some sobering reflections on the need for efficiency in our future water resource development and the remolding of the ideas of some of our citizens about keeping the past upon its throne. Certainly, circumstances will compel the State eventually to do what is required to meet the needs of a burgeoning population. The really significant question at issue, however, is not whether the State will act differently in the management of its water resources (this is foreordained), but rather how Marylanders can get timely and properly conceived action on their rapidly approaching needs.

Economic Ambitions and Ideals of Livelihood

It is unthinkable that the citizens of Maryland should regard the future in any other light than do most other Americans. Economic growth and an increasing level of living have almost come to be regarded among us as a birthright. So has a stable source of income and employment, adequate publicly supported means of sanitation and access to the amenities of outdoor recreation, which more and more are concerned with water resources.

The meaning of our fortunate national habits of expecting economic growth and an ever-improving level of living best can be illustrated by the coming demands on outdoor recreational facilities. In a carefully analyzed projection, the United States Department of the Interior estimates that visits to National Parks, which totalled 63 million in 1959, will quadruple by 1980 and be more than six times as great by the year 2000.¹ Pressure upon other outdoor recreational resources may be expected to increase in proportion from the continued effects of increasing population, income, travel and leisure time.

Because of its location within one of the great urban zones of the world, the increase in recreational pressures

¹ United States Senate Select Committee on National Water Resources, Committee Print No. 17, "Water Recreation Needs in the United States, 1960-2000," p. 1.

on Maryland's water resources may be expected to be at least as great as that anticipated for the National Parks and very likely more. Clearly, the demands upon the water resources of the State cannot be thought of in terms of the past and the problems and opportunities of the future must be viewed in a wholly different dimension.

Problems To Be Faced

Within the relatively short period of forty years, the State thus can anticipate striking demographic growth. Whether or not this means equally striking prosperity, comfort and convenience for a majority of the State's citizens is not so certain, for they will depend in a substantial measure upon foresighted action taken by the State, commencing now. And the way in which the water resources of the State are managed from this time onward can play an important role. To have a laissez-faire attitude and to continue the methods and structure of water resource management of the past definitely will not be equal to the times. If the people of the State are not to be short-changed on the use of their substantial water resources, there must be administrative recognition of certain basic problems and opportunities, a concerted program to meet those problems and opportunities and an administrative organization capable of carrying out the program.

Briefly stated, these problems are: (1) the provision of adequate, good-quality, domestic water supply for a rapidly growing urban and suburban population; (2) the provision of adequate rural domestic water supply systems where needed; (3) the provision of industrial water supplies with standards of quality needed to attract further industrial development of all desirable types within the State; (4) the provision of water for agricultural use as needed by the State's farming industry to capitalize on the huge market which will become available to it within a relatively short radius; (5) use of the State's inland waters and Chesapeake

Bay in a manner which will enable the State to serve adequately the recreational needs of the millions of people in Maryland and adjacent territory interested in using those resources, and in a manner which will enable the State to profit to the fullest from that interest;¹ (6) the development of all of the resources of Chesapeake Bay and its shores in a manner which will best serve the economic growth and the social needs of the State.

Summarized, these problems mean the provision of vital and essential water services to millions of people who soon will be added to the State's population. They mean the management of water resources in a manner which will accommodate fully the economic growth desired for the State. They mean management that will provide the best possible base for tax revenues the State urgently will need in a dynamic situation calling for always expanding services.

¹ Pollution problems and other difficulties must be reviewed very carefully in light of these needs.

Chapter 2

RECOMMENDED PROGRAM AND PROCEDURAL OBJECTIVES

To meet effectively these problems, a program encompassing the following procedural objectives for the future administration of the State's water resources is recommended.

Integrated Watershed Development

The State shall plan for the use of water and regulate water development on the basis of the integrated consideration of an entire watershed, or, where appropriate, a group of adjacent watersheds. The use of ground water and surface water should be considered in the same plans. In the unusual cases where ground water is the dominant water resource, a district considered appropriate for the management of aquifers may be the geographical unit for planning and development rather than the watershed.

Multiple-Purpose Planning

All use of water and development of the water resources shall be on a multiple-purpose basis appropriate to the future of the watershed and the area it serves. This means that the future of an area will be considered while there still is time. Recreation and the related fish and game activities shall be considered co-equal purposes in such planning and development along with domestic and industrial water supplies, waste-carrying, irrigation and other uses directly related to commercial activities. All plans for single-purpose development or single-purpose water use shall be considered in their relation to integrated multiple-purpose use on a given watershed before State approval for such development is granted. In particular, plans for water services to urban and suburban areas shall be considered in their relation to the integrated future use of water on a watershed or other appropriate recognized water resource area.

Separate Marine and Inland Resources

Programs for the development and management of marine resources and marine border lands should be separately conceived and separately administered within the State organization, with the exception of wildlife resources. The State profitably can give more emphasis to the potentialities of Chesapeake Bay resources than heretofore.

High Quality Research

Special care shall be given to the stimulation and maintenance of high quality research on the State's water and biotic resources. The consideration of results from such research shall be mandatory in all future planning for and management of the State's water resources. That no corporation has yet lost money by supporting high quality research is an axiom of the business world deserving of adoption by the State.

Competitive Opportunity for Personnel

State personnel policies should be adjusted so as to provide competitive opportunities within State water resource planning and management agencies for high quality personnel. For a number of functions, the principle should be observed that a few eminently competent persons always will yield far greater long-lasting benefits to the State than a larger number of persons of only average ability. In attempting to place the State in a more effective competitive position for high quality personnel, account should be taken of the rapidly advancing rates of professional compensation over the past decade. Maryland is particularly vulnerable to competition because of its position adjacent to the administrative center of the Federal Government in these fields.

Demonstration Projects

The State should support and manage demonstration projects where needed to establish a pattern of resource

use compatible with the general welfare of the State. Although this method may be applied to several different needs, its use may be illustrated best in the Chesapeake Bay shellfish problem, where it first should be applied.

A New Approach to the Chesapeake Bay Shellfish Problem. It is depressing to note that the basic problems of the Chesapeake Bay oyster fishery were recognized seventy-five years ago and that a solution was proposed for those problems then which remains valid today. This solution was based simply on the principle that a fruitful harvest will be reaped only if attention is paid to sowing and cultivating.¹ Yet no significant action was taken during the continuous decline in this fishery which extended from 1890 to 1930. The fishery by that time had descended to the low plateau of production where it has remained ever since. Although consistent efforts at propagation and shell planting by the Tidewater Fisheries Commission probably have prevented a decline to a still lower plateau of production, the Bay is probably producing today from a fifth to a tenth of what it might under another form of management. As is generally known, the reason for this lies in the opposition of those most concerned with the fishery to the fishing limitations needed for successful cultivation.

This is neither an unprecedented nor insoluble situation, however. A number of parallels exist in resource management of the past, particularly in forestry, where the tenets of deeply ingrained opposition to new practices were successfully changed. The present approach of treating the problem more or less on a State-wide basis would seem too diffuse and an easy road to continued frustration. An essential need is education; and in this connection nothing can serve better than an intelligently managed demonstration project on oyster cultivation, supported as

¹ See William K. Brooks, *The Oyster*, The Johns Hopkins Press, Baltimore, 1891, p. 230 and ff.

long as needed to distribute the message of the results fully. Preferably, this should be done with the cooperation and participation of one community, but if such is not forthcoming, the project can be undertaken independently by the State. Budgetarily, the program probably can be self-supporting over the long run.

A Program Strategy

The recommendation for the use of demonstration to achieve better resource use, as illustrated in shellfish cultivation, leads to a final recommendation on program objectives: there should be a clear, but reasonably flexible, view of the long-term needs for resource development by the State organization, but *immediate* objectives of the agencies should always be kept reasonably concrete and capable of achievement. Thus, future reviews of programs, which will be recommended below, should keep in mind that an agency is apt to show the best record of accomplishment where it constantly distinguishes in its work between immediate and long-range objectives, but without ever losing sight of the latter and the need for their periodic re-evaluation.

To permit flexibility and to guide the strategy, it will be important to have at least biennial revisions of population projections, major foreseeable changes in land use, pertinent economic and recreational trends and estimates of the effect of recent major technological innovations.

State Leadership or Federal Leadership? Attention to strategy and to the objectives mentioned above for State programs will be essential if the State considers it important to exercise leadership in the development of its own resources. For at least twenty-five years now the federal government has offered an increasingly dominant voice in resource planning and development. In a number of states, particularly in the West, state resource programs often are something of an appendage to larger federal government

operations. While it is less true in Maryland and elsewhere in the East, the operations of some State agencies still are influenced strikingly by federal agencies, like the U. S. Army Corps of Engineers and the U.S. Fish and Wildlife Service, who supply financial assistance and technical guidance. Generally it is the federal agencies which have the well-thought-out programs and the strategy, with the State agency following the federal lead almost by default.

Federal assistance is highly desirable and undoubtedly will continue to be beneficial to the State in the future. However, the State is likely to get the most for its money, and the best out of federal assistance if it has its own mature plans for a future program and an organization capable of carrying it out. The ideal would be to have the State program so skillfully conceived that federal assistance must necessarily follow a pattern set by the State. In general this has not been true in the past. The most beneficial program for the State is not necessarily what federal government agencies propose to the State as both desirable and possible.

The need for a well-informed point of view and a purposeful State voice is further emphasized in moves now beginning in the Washington metropolitan area to develop an organization which will speak for the metropolitan area as a whole. *To cope with the future influence of this kind of organization, the State will have to know its mind and be prepared to meet demands for use of its resources by non-State entities. It must provide an organization which can do this.*

Chapter 3

METHOD OF CARRYING OUT PROGRAM

Three possible methods of carrying out a program designed to meet the objectives herein stated as essential to the future of the State were considered: (1) maintenance of the present agency structure without change; (2) merging of all conservation and resource management activities into a single conservation department, as has been done in some other states and (3) maintenance of the present agency structure with some secondary and "modernizing" changes.

The first was rejected because careful study disclosed that the present agency structure without change does not offer favorable prospects for dealing effectively with the problems of the future, particularly those which require State initiative in comprehensive development.

Establishment of a single conservation department embracing all resource activities has a number of partisans in the State, and an organization of this type admittedly has some very obvious attractions. However, it has been rejected as an answer to the State's problems at this time for three reasons: (a) the present organization, provided a few critical changes are made, offers certain attributes well worth preserving and several of its agencies have substantial records of accomplishment; (b) use of the present agency structure offers opportunities for flexibility and emphasis not likely to be obtained with a single conservation department; (c) finally, and not the least, it offers prospect for early settlement and therefore for early effective action on a program. A single Department of Resources or Department of Conservation, on the other hand, might require years to establish to the detriment of immediate agreement on urgently needed program and strategic planning measures.

It is therefore recommended that future State organization for the development of water and related resources retain substantially the structure which it now has. However, some revision and strengthening of this organization is recommended for the following reasons: (a) to provide a single focus of responsibility for multiple-purpose planning and development on an integrated watershed basis; (b) to strengthen and coordinate the research program on water and biotic resources; (c) to separate activities concerned with marine resources from those concerned with inland water and related resources; (d) to avoid the diverted attentions and diffuseness which are encouraged by present authorizations and responsibilities, caused by mixing coordination and operation, research and operational functions and other dual or multiple responsibilities within the same small agency and (e) to improve the quality of research and management efforts.

Chapter 4

THE RECOMMENDED AGENCIES AND THEIR FUNCTIONS

In brief, the major changes in present agency structure recommended are as follows: the formation of a Department of Water Resources to include the functions of the Water Pollution Control Commission and some operational functions of the Department of Geology, Mines and Water Resources; the establishment of a Department of Chesapeake Bay Affairs to be formed around the present Tidewater Fisheries Commission; the consolidation of important research functions, including those of the Department of Research and Education, under the supervision of the University of Maryland; and a strengthening of the Board of Natural Resources so as to make it a center for coordination, review, adjudication and the supervision of inter-agency relations, including those with federal government agencies and agencies of other states.

These recommendations as they relate to present and proposed new agencies are detailed below.

Department of Game and Inland Fish

It is recommended that the responsibility "to administer a number of artificial islands in Worcester County" be transferred from the Board of Natural Resources to the Department of Game and Inland Fish.¹

Department of Forests and Parks

It is recommended that the responsibility "to maintain in good condition the monuments marking the boundaries of the State" be transferred from the Board of Natural Resources to the Department of Forests and Parks.

¹ Inasmuch as they constitute nesting areas for migratory birds and public hunting lands for waterfowl during the open season, the Board of Natural Resources has already, in fact, designated the Department of Game and Inland Fish as the administrative agency over these islands in the Sinepuxent Bay.

Department of Water Resources

It is recommended that this new agency be generally responsible for supervising and planning for the multiple-purpose development of the inland surface waters and ground water resources of the State. A principal responsibility of the agency would be the timely preparation of advance plans which will permit water development to go forward as needed in a manner compatible with multiple-purpose management on a watershed basis. Eventually, it should have available a systematic analysis of the multiple-purpose potentialities of all important watersheds in the State. This Department will have no responsibility for marine activities other than to exercise control over the appropriation and pollution of the tidal waters of the State.

Insofar as they are not covered by the above statement of general function, the present responsibilities and objectives of the Maryland Water Pollution Control Commission, as described under Article 66C, Sections 34 to 35 of the 1957 Annotated Code of Maryland and the 1959 Cumulative Supplement, will be transferred to the Department of Water Resources. In addition, some functions of the Department of Geology, Mines and Water Resources, insofar as they relate to inland water resources and are described in the same Article 66C, shall be transferred to this Department. This will include particularly the responsibility "to control the use of the State's surface and underground waters and the construction and repairs of reservoirs, dams, and waterway obstructions," and supervision of well drilling, insofar as it concerns water.

All personnel of the Water Pollution Control Commission will be transferred to the new Department of Water Resources. Personnel of the present Department of Geology, Mines and Water Resources now concerned primarily with water resource management activities will be given

an opportunity to transfer to the Department of Water Resources if it is their wish to do so.

This Department will be a key agency in the future rational administration of the water resources of the State. If supported by an adequate budget, it can save the State many times its annual cost in providing answers to difficult water problems before they become crises and in providing a strong well-informed State voice in shaping the course of federal activity within the State, as on the Potomac which is a Maryland stream. Considering the scope and magnitude of the responsibilities assigned to this agency, certainly the initial annual budget would have to be larger than that required for the support of the present Water Pollution Control Commission. Later budget increases would, of course, depend upon demonstrated need and potential accomplishments.

Department of Health Bureau of Environmental Hygiene

No change recommended other than authorization for participation of the Bureau in future deliberations and decisions of the Board of Natural Resources.

Because of its essential relationship to multiple-purpose planning and management on a watershed basis, consideration was given to recommending the transfer of the Bureau's present regulatory authority over the subdivision of land to the proposed new Department of Water Resources. It was believed, however, that the same ends would at this time be served, if in the conduct of this important administrative activity, the Bureau gives due consideration to the carefully thought-out plans of the Department of Water Resources.

Department of Geology, Mines and Hydrology

It is recommended that this Department be continued, as renamed, as the State's geological agency. The total annual budgetary allocation for it should be about the same as that for each of the last few years. The Department

would retain its functions of conducting topographic, geologic, hydrographic and magnetic surveys and preparing maps therefrom; its function of preparing reports on the extent and character of the State's mineral and water resources; its responsibility "to control the drilling of oil and gas wells" and its responsibility "to investigate and recommend plans and policies for the protection of the waterfronts and waterways of the State against erosion." The functions of the Bureau of Mines would be retained in their entirety. However, the presentation of a single annual budget for the Department, instead of two as in the past, is recommended.

The suggestion has been made in some quarters that this Department, instead of having certain functions transferred from it, should be made responsible for the administration of multiple-purpose planning and development within the State. This suggestion, although considered, was not accepted because the orientation of the Department has been and probably always should be that of professional geology. However, the maintenance of the University connection enjoyed by this Department and its research capacities of professional geology are an asset to the State's water program which should be preserved and encouraged. The value of the Department to the State will be at its best if its orientation is kept as close to research and survey functions as possible. In that, it has a close parallel to the United States Geological Survey of the federal government, whose dominant research orientation has been greatly to the benefit of hydrology and the operational needs of other federal departments. The Department of Geology, Mines and Hydrology essentially would be the agency of the State government responsible for research on the physical attributes of the minerals, lands and waters of the State, and mine supervision.

Department of Chesapeake Bay Affairs

It is recommended that the Department of Tidewater

Fisheries be renamed the Department of Chesapeake Bay Affairs and its objectives and responsibilities broadened so as to include not only the present objectives of the Department of Tidewater Fisheries, but also such additional responsibilities as may be needed to promote the development of Bay and all other tidewater resources to the fullest degree compatible with the general welfare of the State. It is further recommended that the Department be given a broad responsibility for planning and managing the Bay and all other tidewaters and shores and their associated resources, excepting wildlife resources and recreational areas for public hunting now under the jurisdiction of the Department of Game and Inland Fish. Included in this responsibility should be all estuarine fisheries, navigation and recreational development.

To carry out this mission, there should be granted to this Department, in addition to the authorizations already given the Department of Tidewater Fisheries, authorization to plan for and develop recreational facilities in the Bay area; authorization to conduct demonstrations of extended duration for the purpose of improving the fisheries, or for such other needs as the Department has in carrying out its mission; and authorization to act for the State in the further development of navigation aids in the Bay area. The latter authorization would include transfer of responsibility "to cooperate in carrying into effect plans for the improvement of the waterways of the State" from the present Department of Geology, Mines and Water Resources to this Department. The Board of Natural Resources' share of responsibility "to administer . . . rare earths and minerals under the Chesapeake Bay" also should be transferred to the new Department.

This action is considered important because of the obvious relation that different marine resources and Bay developments have to each other and because of the huge future demands which Bay resources can serve, but which

they cannot serve without careful planning and public action. The Department should look upon its program as one of careful planning at an early date, consistent education and gradual evolution of the full productive potential of the Bay area.

University of Maryland

It is recommended that the present functions and facilities of the Department of Research and Education, including the Solomons Laboratory, and the research and field operations of the University of Maryland relative to the Chesapeake Bay, including the Crisfield Laboratory, be consolidated under the operational supervision of the University. Thus, the State would have two viable centers for research needed on its resources: one on the physical resources in the Department of Geology, Mines and Hydrology, associated with The Johns Hopkins University, and the other for research on biological and organic subjects, under the supervision of the University of Maryland.

There are several reasons for this recommendation. First, the quality of personnel needed by the State in research is more likely to be attracted and kept under University auspices than it is by an operational agency. Second, an essential program of basic research can be maintained stably under University auspices. The third reason relates to the exceedingly rapid movement of modern biology and microbiotic research, where ready access to a variety of specialists is extremely important. A small independent agency does not have the same competitive opportunities for attracting such personnel as that enjoyed by a university-connected department. Finally, a university is always an excellent place for recruiting junior workers and temporary staffing so necessary where project research expands and contracts. No other environment can supply the same economies and quality of research.

In consolidating under the operational supervision of the University, a clear distinction should be made between

research functions and the extension education functions which are now served by the present Department of Research and Education. The first responsibility and the greatest need, both immediate and over the long run, are for research results which move forward our understanding of the State's biotic resources and their responses to environment.

The budget provided for this division of the University should be sufficient for the conduct of a continuous program of long-range, basic research and for the carrying out of its extension education functions. As presently will be discussed, supplementary financial support would derive from the conduct of research contracted for from time to time by the member agencies of the Board of Natural Resources.

Board of Natural Resources

The Board of Natural Resources should be strengthened and given a clear position of responsibility for coordination, program review and adjudication of conflicts which may arise among the resource agencies, recognizing, of course, the right of appeal to the Governor. It should keep account of the long-term objectives of each of the resource departments of the State and report annually to the Governor on the progress of each department. In addition, the Board should be the initial point of contact for the State with federal agencies and with all agencies of other states when any new federal or regional program is presented or explored, excepting when by federal law such contacts must be made directly through a member agency.

For its own use, and for the guidance of all State resource management and development agencies, the Board should cooperate with the State Planning Department in the preparation of a biennial "background" report giving current revisions of: (1) population projections for the State; (2) land use trends; (3) trends in recreational de-

mand and (4) major technological innovations expected to influence resource use. The objective would be that of keeping up to date an official view of the future, i.e., quantitative data which the Board's member agencies can use in planning their programs and budgets.

The Board should have no operational functions at any time other than those related to the above responsibilities.

The directors of the Departments of Game and Inland Fish, Forests and Parks, Chesapeake Bay Affairs, Water Resources, Geology, Mines and Hydrology, as also representatives of the Department of Health Bureau of Environmental Hygiene, the State's research function at the University of Maryland and the State Board of Agriculture, should sit on the Board along with representatives of the public. The Chairman should be appointed by the Governor, but no incumbent or staff member of an agency represented on the Board should be eligible to be Chairman. Provision should be made for the employment of the Chairman as a full-time State official. The staff of the Board should be strengthened so as to provide the necessary professional assistance to pursue effectively the objectives of the Board as stated above.

Directors and Commissions of Conservation Departments

In the interest of strengthening this vitally important area of State government administration, it is recommended that the directors of the Departments of Game and Inland Fish, Forests and Parks, Chesapeake Bay Affairs, Water Resources, and Geology, Mines and Hydrology be appointed by the Governor to serve at the Governor's pleasure. It is further recommended that the respective commissions of these departments be made advisory without any administrative responsibilities.¹

¹ For an excellent discussion in support of these two recommendations, see The Council of State Government's, *Reorganizing State Government*, Chicago, 1950, pp. 3-20.

Chapter 5

FURTHER GENERAL PROVISIONS FOR EFFECTIVE OPERATION

Provision for Meeting Operational Agency Research Needs

Provision has been made in the proposed structure for the future administration of the water resources of the State for recognizing the special problems of administering research personnel and for guaranteeing, as far as possible, the independence essential to high quality research. In the business community even the most self-interested corporations have recognized the wisdom of separating research from operational responsibilities. This dictum has been adhered to in the recommended structure.

However, there remains the problem of meeting the needs of the operational agencies, whose recognition of the value of research even now is real. They have a right to the most effective research support possible. How is this to be guaranteed?

To assure each operating agency of its capacity to meet research requirements, it is recommended that each be allotted in its annual budget a sum which may be used during the ensuing biennium for contract research, the contracts to be let where the agency feels the research most effectively can be performed. One officer of the agency should be made responsible for the administration of such contracts and the liaison necessary to supervise them. This officer should have experience either in research or in the administration thereof.

It is hoped that the research establishments of the State, both in its Department of Geology, Mines and Hydrology and at the University of Maryland, would be of such calibre that the operating agencies automatically would turn to them with their contract projects. However, if they were not favored for reasons of promised performance, the operating agencies would be free to contract for research else-

where. This device of permissive authority in the awarding of research contracts has been followed effectively in meeting many federal needs in the resources field. As practiced in Maryland, it undoubtedly would provide added stimulus to the research establishments of the State to maintain high standards of quality.

To supplement these provisions and further guarantee that the State will have the quality of research needed in all resource fields, it is recommended that a review of the administration of research in the State organization be conducted by the Planning Department. Such a review would analyze: (1) anticipated needs for research, including basic and applied; (2) means of meeting these needs, including State, federal and private establishments; (3) the adequacy of current State budgets for research and (4) possibilities for further improvement within the existing budgets. Effective research is a key to State leadership in resource development. The State should be certain that what it does, even if modest, is effective.

Attracting Personnel of High Competence

The high grade of performance which the State will need in the future ultimately will depend upon the quality of personnel the State can attract and keep in key positions throughout the recommended structure of water resources administration. For positions requiring professional training, it is no secret that bargains are found only in the ability and performance of highly qualified persons. Today, top-level people are neither attracted nor held in professional positions by salaries and other compensation below prevailing national levels. As previously noted, there has been a particularly rapid increase in professional salaries throughout the nation during the last ten years, and over the last five years the rate of compensation in some fields has increased about ten per cent annually. It is recommended, therefore, that the State examine this

situation with a view to establishing a competitive position for attracting and holding key professional personnel of high ability in positions where imagination and initiative are required.

Budgetary limitations are always very real considerations to both legislators and chief executives. There will always be needed limitations on total expenditures. However, it would be a far better investment for the State to spend its available funds on smaller staffs of high quality than on larger staffs of only medium promise and attainment. Rigid adherence to this principle is strongly urged in the best interests of the future vigor of the State and its capacity for economic and social growth.

Chapter 6

CONCLUSION

If the above recommendations are implemented, the State will have taken a long step in the direction of providing itself with the means of meeting effectively many of the pressing problems certain to be faced during the remainder of the century. These will be no ordinary times. They will call for something more than that which was good enough in the past: clarity of vision, flexibility and a capacity for ready adjustment, a structure of government upon which the State can build as unforeseen demands arise. Where there is diffused responsibility and a lack of agreement on objectives, constructive action is difficult and often impossible. With a minimum disruption of the present structure of organization and only a modest increase of expenditure, the State can take steps to change an organization of its water resources administration which certainly is not now well suited to the future. It should make the proposed revisions at the earliest opportunity.

TABLE 1

POPULATION PROJECTIONS FOR THE STATE OF
MARYLAND AND CERTAIN ADJACENT AREAS

1980 and 2000

(In thousands)

	1958 <i>Actual</i>	1980 <i>Projected</i>		2000 <i>Projected</i>	
		Median	High	Median	High
Maryland ¹	2,956	4,876	5,552	6,915	9,046
District of					
Columbia ¹	825	951	1,082	1,218	1,594
Delaware ¹	454	853	972	1,251	1,637
Some Adjacent Counties					
of Virginia and					
Pennsylvania ²	600	800	1,000	1,200	1,500
Total	4,835	7,480	8,606	10,584	13,777

¹ Source: United States Senate Select Committee on National Water Resources, Committee Print No. 5, "Population Projections and Economic Assumptions," pp. 6-7.

² The figures shown for adjacent counties are based upon data for Virginia and Pennsylvania contained in U. S. Senate Select Committee, Print No. 5, pp. 6-7. Only a fraction of the population of either state is included.

TABLE 2

MARYLAND ANNUAL OYSTER PRODUCTION

1891-92 to 1959-60

<i>Year</i>	<i>Bushels ¹</i>	<i>Year</i>	<i>Bushels ¹</i>
1891-92	11,632,730	1948-49	2,702,814
1919-20	4,592,001	1949-50	2,495,787
1929-30	1,837,421	1950-51	2,170,556
1939-40	3,129,403	1951-52	2,339,976
1940-41	3,429,040	1952-53	2,642,147
1941-42	2,792,069	1953-54	2,129,115
1942-43	2,328,541	1954-55	2,878,755
1943-44	2,451,194	1955-56	2,799,788
1944-45	2,436,133	1956-57	2,259,882
1945-46	2,322,185	1957-58	2,190,074
1946-47	2,157,838	1958-59	1,968,894
1947-48	2,027,381	1959-60	2,085,140

¹ The Maryland oyster "bushel" is 2800.7 cu. in., or about 1.3 the volume of the standard bushel. Maryland oysters yield about 6.42 pounds of meat per oyster bushel.

Source: Board of Natural Resources, State of Maryland,
State Office Building, Annapolis

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